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The following publications were taken into account for the determination of patentability:

US Pat. 3,193,959

EP 0 959 319 A2

[Title in German of the object of the invention:]

Sicherungsvorrichtung einer Schußwaffe gegen unbefugten Gebrauch

## SAFETY DEVICE OF A FIREARM AGAINST UNAUTHORIZED USE

(57) In order to secure hand weapons (light weapons) and small arms against unauthorized use, an insert (4) is inserted into a part of the barrel (1), which insert has an expanding sleeve (5). A first expanding device (9,10) is detachably inserted into one of the ends of the expanding sleeve (5), which expanding device - as a result of this - presses in a blocking

way against the inner wall system of the barrel. A second expanding device (60) [sic] is inserted into the other end of the expanding sleeve (5). If an axial pressure is exerted upon the second expanding device (16), the expanding sleeve (5) is interlocked with the inner wall system of the barrel. One of the ends of the expanding sleeve (5) is covered with a protective disk (13), which can be destructed only as a result of spark erosion, when the expanding sleeve (5) is to be removed from the barrel (1).

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Description

The invention pertains to a safety device of a firearm, against unauthorized use.

The hereditary privilege in the law of weapons stipulates that the heirs of a testator, which was authorized to bear a firearm, come into the possession of the weapon regardless whether these heirs are authorized or not to bear a firearm. IF we take into consideration the fact that only in Germany there are about 10 million weapons, which are privately possessed, it means that a substantial risk of the misuse of such weapons or firearms exists.

In order for a firearm to be secured against unauthorized

use, it is known that the barrel is to be blocked by means of a lock of the kind of a quick-lock-closure system (compare EP 0 959 319 A2). However, that kind of securing is inadequate. Such a lock can be crushed.

A safety device for a firearm, which contains an expanding sleeve, which can be inserted into the cartridge chamber of the fire arm, is known from the US Pat. 3,193,959. That expandable sleeve or collar can be forced against the inner wall system of the cartridge chamber by means of two shiftable cocking cones, in order for a loading to be prevented. However, in order for a safety device of that kind to be removed, only a pin, which is tip-stretched or integrally molded on the clamping cone, should be pushed back by means of a cleaning bar, or similar, which has been introduced into the barrel, whereby the expandable sleeve is slackened or uncocked. Therewith, that safety device can also easily be removed without a special tool.

It might be possible to destruct functionally important parts of a firearm, in order to render the latter unusable. However, this is not possible when the issue under consideration pertains to valuable firearms or weapons, whose value is considerably reduced as a result of the said destruction.

The objective is to create a safety device, which can be detached or disengaged by an expert, whereby the attempt at an unauthorized detachment or disengagement leads however to a damage of the firearm.

The set objective is achieved with the help of the characteristic features of patent claim 1. Advantageous designs can be deduced from the subclaims.

The safety device has two functions whereby one of the functions is comparable to [the function of] a straddling dowel\* [\*Translator's note: Also called expansion plug; hammer plug], and the other function can be compared to [that of] a blind rivet.

An exemplified embodiment is elucidated in greater detail by means of the drawing wherein

Fig. 1 shows the safety device on an enlarged scale, and

Fig. 2 shows the safety device in assembled state in a cartridge chamber.

In the rear part of the barrel 1 of a firearm, there is situated the cartridge chamber 2, having a shoulder 3. The safety device ought to be inserted into this cartridge chamber 2.

The safety device consists of an insert 4, which can be inserted into the cartridge chamber 2. This insert 4 has an expanding sleeve 5. The expanding sleeve 5 has four slots 6, arranged crosswise, which run from the front end up to the area in the rear end of the expanding sleeve 5. In the rear end, the borehole 21 of the expanding sleeve 5 is provided with a thread 7; which ends in the front area, at a shoulder 8, protruding into the borehole interior. Into the rear end of the expanding sleeve 5, there can be inserted a first expanding device, consisting of a spheroid [ball] 9 and a threaded pin 10. In inserted state, the

ball 9 comes in contact with the shoulder 8. The threaded pin 10 can be screwed into the thread 7.

In addition to this, the rear end of the expanding sleeve 5 has a borehole 11, into which the cylindrical projection [lug, shoulder] 12 of a [protective disk 13 can be inserted. The expanding sleeve 5 has an almost concentrically arranged projecting segment 14.

On its front-end, the expanding sleeve 5 has a borehole 15, having the shape of a truncated cone. Into this truncated-cone shaped borehole 15, there can be inserted a tapered pin 16, which is monolithic with regard to an additional protective disk 17. This protective disk 17 has a circumferential groove 18, which accommodates a sealing ring 19. The borehole, having the shape of a truncated cone, and the tapered pin 16 have such an angle of cone dispersion [angle of opening] that when the tapered pin 16 is driven into the borehole 15, these two are interlocked.

On the front-end, the expanding sleeve 5 is provided with two uninterrupted, sharp-edged [angular] projections 20.

The protective disk 13 with its cylindrical projection 12 and the tapered pin 16 with its protective disk 17 consist of a material, which withstands the onslaught of commercial-quality tools, however it can be razed or reduced in size as a result of spark erosion. Preferably, the material consists of hard metal.

In order for the cartridge chamber to be secured, the tapered pin 16 is inserted into the borehole 15, and the sealing

ring 19 is placed upon the circumferential groove 18. The ball 9 is inserted into the borehole 21, and the threaded pin 10 is screwed together with the borehole 21 in such a way that the ball is reacting loosely against the shoulder 8. Now, the insert 4 is inserted into the cartridge chamber 2, until the sealing ring 19 comes in contact against the shoulder 3 of the cartridge chamber 2. After this, the threaded pin 10 is screwed in firmly into the borehole 21, as a result of which the ball 9 - by means of the shoulder 8 - expands the expandable sleeve in its central area. Therewith, flat-shaped segment, while subjected to compressive stress, comes in contact with the wall of the cartridge chamber 2. The segment 14 can be roughened, and - where applicable - its surface can be coated with microcapsules, which contain a 2-component adhesive so that the segment 14 is additionally glued to the wall of the cartridge chamber 2.

After this, the cylindrical projection 12 is force-fitted into the borehole 11. The diameter of the protective disks 13, 17 is a little bit less than the diameter of the cartridge chamber 2. In assembled state, the length of the insert 4 is smaller than the length of the cartridge chamber 2 so that in inserted state the protective disk 13 is at an interval from the rear end of the cartridge chamber 2.

If a striking tool or a compressive tool is introduced into the rear end of the cartridge chamber 2, with the aim to damage, respectively destruct the protective disk 13, then it is indeed

possible that the blocking or jamming between the segment 14 and the wall of the cartridge chamber 2 is overcome, however, the tapered pin 16 concurrently penetrates further into the borehole 15, and, therewith, expands the front-end of the expandable collar 5. As a result of this, the sharp projections 20 penetrate into the material of the wall of the cartridge chamber 2, and are engaged therein. As a result of this, the cartridge chamber 2 is rendered unusable.

If the attack takes place on the protective disk 17, the same is brought about as a result of this, i.e. the front-end of the expanding collar 5 expands.

If the insert 4 is removed from the cartridge chamber 2 in an authorized way, a spark erosion tool is then applied on the protective disk 13, in such a way that the cylindrical attachment or shoulder 12 can be removed from the borehole 11. Therewith, the threaded pin 10 is accessible and can at least be unscrewed to such an extent that the wedging or blocking is neutralized at an interval 14.

After the threaded pin 10 is removed, it is also possible to insert an extractor into the borehole 21, and, therewith, to draw out or extract rearwards the insert 4 out of the cartridge chamber 2.

#### Patent Claims

1. Safety device of a firearm [to protect] against unauthorized use, which safety device has an insert (4), which can be inserted into a part of the barrel (1), which insert has an expanding sleeve (5), having a first expanding device (9, 10), which can detachably be inserted from one of the ends into the expanding sleeve (5), and which expanding device, in inserted state, presses a part of the expanding sleeve (5) in a wedging or blocking manner against the inner wall system of the barrel, having a second expanding device (16), which can be inserted from the other end into the expanding sleeve (5), and which - when a pressure is exerted in the direction of the axis of the expanding sleeve, expands an additional part of the expanding sleeve (5), which part is entangled with the inner wall system of the barrel whereby at least one of the ends is covered by a protective disk (13), whose material can be destructed only as a result of a spark erosion, and releases - in partially destructed state - the access to the first expanding device (9, 10).

2. Safety device as claimed in claim 1, characterized in that the expanding sleeve (5) has slots (6), running in the longitudinal direction, which begin from one of the ends of the expanding sleeve (5), and end at an interval to the other end.

3. Safety device as claimed in claim 1 or 2, characterized in that one part of the expanding sleeve (5) is a segment (14), arranged almost concentrically, and that the concentric segment (14) has a roughened surface.



4. Safety device as claimed in one of the claims 1 thru 3, characterized in that the first expanding device (9, 10) can be screwed in into the expanding sleeve (5).

5. Safety device as claimed in claims 4, characterized in that the first expanding device (9, 10) comprises a threaded pin (10), which - while in screwed state - presses against a ball (9), which runs against a shoulder (8), constricting the borehole (21) of the expanding sleeve (5).

6. Safety device as claimed in claim 4, characterized in that the first expanding device (9, 10) comprises a threaded pin (10), which has a tip, having the shape of a truncated cone, which runs against the shoulder (8), constricting the borehole (21) of the expanding sleeve (5).

7. Safety device as claimed in one of the claims 5 or 6, characterized in that the shoulder (8) is designed as running slantingly.

8. Safety device as claimed in one of the claims 1 or 2, characterized in that the ~~additional~~ part of the expanding sleeve (5) is arranged on the other end, and has a sharp surface formation, penetrating into the barrel inner wall system.

9. Safety device as claimed in claim 8, characterized in that the surface formation consists of at least an uninterrupted sharp-edged or angular projection (20).

10. Safety device as claimed in claim 8, characterized in that the surface formation consists of sharp-edged teeth.

11. Safety device as claimed in one of the claims 8 thru 10, characterized in that the surface formation is designed as barbed in shape, and - while in expanded state - interlocks with the inner wall system of the barrel.

12. Safety device as claimed in one of the claims 1 thru 11, characterized in that the second expanding device (16) consists of a tapered pin (16), which rests against a borehole (15), having the shape of a truncated cone, and wedges or locks with it.

13. Safety device as claimed in one of the claims 1 thru 12, characterized in that the other end is also covered by an additional protective disk (17), whose material is analogous to that of the protective disk (13), covering this one end.

14. Safety device as claimed in claim 13, characterized in that the additional protective disk (17) is monolithic with respect to the tapered pin (16)

15. Safety device as claimed in one of the claims 1 thru 14, characterized in that one of the protective disks (13) has a cylindrical shoulder [attachment or projection] (12), which engages after being force-fitted into a borehole (11) on one of the ends of the expanding sleeve (5)

16. Safety device as claimed in one of the claims 1 thru 15, characterized in that the insert (4) in the cartridge in the cartridge chamber (2) is designed so that it can be inserted.

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1 page of drawings

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